

## **REMARKS**

Claims 1-35 were considered by the Examiner. Claims 1-35 stand rejected by the Examiner. In this response, claim 24 has been amended. Claims 1-35 are pending, and are believed to be allowable over the references cited by the Examiner as discussed below.

### **Claim Rejections under 35 USC Sec. 103**

Claims 1-2, 4-6, 9-11, 13, 15-17, 20-22, 24, and 26-32 stand rejected under 35 U.S.C. 103(a) as being anticipated by Weigand (USPN 6,850,617) in view of Feltstrom et al. (PGPUB 2002/0090078).

#### **Claim 1**

1. (original) A voice activity detect (VAD) method for detecting voice activity in communications signals, comprising the steps of:

determining an average noise energy level of the communications signals based on noise energy amplitude during periods of no voice activity;

converting the average noise energy level to sidetone attenuation, the sidetone attenuation increasing with increased noise energy level;

generating a VAD threshold based at least in part on the sidetone attenuation; and

performing VAD based on the generated VAD threshold.

Independent claim 1 recites a voice activity detect (VAD) method that generally includes determining an average noise energy level of the communications signals based on noise energy amplitude during periods of no voice activity, converting the average noise energy level to sidetone attenuation that increases with increased noise energy level, *generating a VAD*

*threshold based at least in part on the sidetone attenuation*, and performing VAD based on the generated VAD threshold. Generating adaptive VAD thresholds based in part on the sidetone attenuation are discussed in the Specification, for example, at paragraphs [0022] and [0035].

Neither Weigand nor Feltstrom, either alone or in combination, teach *generating a VAD threshold based at least in part on the sidetone attenuation*.

Weigand discloses a telephone receiver circuit with sidetone signal generation controlled by voice activity detection by using a voice activity detector (VAD) to detect the presence of voice activity and dynamically adjust the sidetone signal generation to compensate for noisy environments by eliminating or reducing the sidetone signal in the absence of voice activity. As the Examiner states in the current Office Action, Weigand does not teach generating a VAD threshold. Office Action dated 4-9-08, page 3, lines 7-8.

Feltstrom discloses a sidetone controller coupled to a side-tone amplifier, where the sidetone controller applies a set of amplifier parameters based on the detected energy of an uplink signal and a downlink signal.

The Examiner contends that Feltstrom discloses generating a VAD threshold based in part on the sidetone attenuation, citing paragraph [0007] of Feltstrom. Specifically, Feltstrom states in paragraph [0007]:

Other existing approaches utilize a gain control mechanism, which adjusts the gain of a side-tone amplifier in response to a detected power level of the uplink signal. For example, the gain control mechanism can decrease the gain of the side-tone amplifier in response to the power level of the uplink signal exceeding a predetermined threshold, and increase the gain of the side-tone amplifier in response to the power level of the uplink signal falling below a predetermined threshold. These approaches, however, adjust the gain of the side-tone amplifier based solely upon the power level of the uplink signal, and

therefore fail to take into account other various side-tone control requirements that arise from a two-way conversation involving both an uplink signal and a downlink signal . . .

However, this paragraph [0007] does not teach generating a VAD threshold based at least in part on the sidetone attenuation. Rather, it simply teaches either decreasing or increasing the gain of the side-tone amplifier based on the power level of the uplink signal in relation to a pre-determined threshold. Feltstrom does not teach that this pre-determined threshold is a VAD threshold, nor does it teach that the value of the VAD threshold is dependent on the sidetone attenuation or generated in response to the generated sidetone attenuation.

Therefore, it is respectfully submitted that claim 1 is patentable over Weigand in view of Feltstrom. Accordingly, Applicant respectfully requests the withdrawal of the rejection of claim 1.

#### Claims 2, 4-6, and 9-11

Claims 2, 4-6, and 9-11 are dependent on claim 1. Therefore, it is respectfully submitted that claims 2, 4-6, and 9-11 are patentable over Weigand in view of Feltstrom at least for the reasons stated above with respect to the patentability of claim 1. Accordingly, Applicant respectfully requests the withdrawal of the rejection of claims 2, 4-6, and 9-11.

#### Claim 13

13. (original) A voice activity detect (VAD) system, comprising:

*an adaptive VAD threshold generator configured to generate a VAD threshold based at least in part on a sidetone attenuation, the sidetone attenuation being based on an average ambient noise energy level determined from a noise energy amplitude during periods of no voice activity, the sidetone attenuation increasing with increased noise energy level; and*

*a comparator configured to compare received signals to the adaptive VAD threshold to determine existence of voice activity.*

Independent claim 13 recites a VAD system generally including *an adaptive VAD threshold generator configured to generate a VAD threshold based at least in part on a sidetone attenuation*, the sidetone attenuation being based on an average ambient noise energy level determined from a noise energy amplitude during periods of no voice activity, the sidetone attenuation increasing with increased noise energy level and a comparator configured to compare received signals to the adaptive VAD threshold to determine existence of voice activity.

As is evident, the elements of independent claim 13 are similar to those discussed above with reference to claim 1, and the same or similar arguments apply to claim 13 and are not repeated for purposes of conciseness and clarity only. Therefore, it is respectfully submitted that claim 13 is patentable over Weigand in view of Feltstrom. Accordingly, Applicant respectfully requests the withdrawal of the rejection of claim 13.

#### Claims 15-17 and 20-22

Claims 15-17 and 20-22 are dependent on claim 13. Therefore, it is respectfully submitted that claims 15-17 and 20-22 are patentable over Weigand in view of Feltstrom at least for the reasons stated above with respect to the patentability of claim 13. Accordingly, Applicant respectfully requests the withdrawal of the rejection of claims 15-17 and 20-22.

#### Claim 24

24. (amended) A communications system, comprising:  
a microphone for receiving communications signals;  
a voice activity detector *utilizing an adaptive VAD threshold*; and

an adaptive sidetone control in communication with the microphone and the voice activity detector, the sidetone control to adaptively control a sidetone level based on an average ambient noise energy level determined from a noise energy amplitude during periods of no voice activity as determined by the voice activity detector, the adaptive sidetone control being configured to adaptively increase attenuation of the sidetone level with increased ambient noise level, *wherein the adaptive VAD threshold is generated at least in part on the sidetone level.*

Independent claim 24 as amended recites a communications system that generally includes a microphone for receiving communications signals, a voice activity detector *utilizing an adaptive VAD threshold*, and an adaptive sidetone control in communication with the microphone and the voice activity detector, the sidetone control to adaptively control a sidetone level based on an average ambient noise energy level determined from a noise energy amplitude during periods of no voice activity as determined by the voice activity detector, the adaptive sidetone control being configured to adaptively increase attenuation of the sidetone level with increased ambient noise level, *wherein the adaptive VAD threshold is generated at least in part on the sidetone level.*

As is evident, the elements of amended independent claim 24 are similar to those discussed above with reference to claim 1, and the same or similar arguments apply to claim 24 and are not repeated for purposes of conciseness and clarity only. Therefore, it is respectfully submitted that claim 24 is patentable over Weigand in view of Feltstrom. Accordingly, Applicant respectfully requests the withdrawal of the rejection of claim 24.

#### Claims 26-32

Claims 26-32 are dependent on claim 24. Therefore, it is respectfully submitted that claims 26-32 are patentable over Weigand in view of Feltstrom at least for the reasons stated above with respect to the patentability of claim 24. Accordingly, Applicant respectfully requests the withdrawal of the rejection of claims 26-32.

Claims 3, 7, 8, 12, 14, 18, 19, 23, 25, and 33-35.

Claims 3, 7, 8, 12, 14, 18, 19, 23, 25, and 33-35 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Weigand in view of Feltstrom and further in view of Hollier.

However, because claims 3, 7, 8, 12, 14, 18, 19, 23, 25, and 33-35 are dependent variously from independent claims 1, 13, and 24, claims 3, 7, 8, 12, 14, 18, 19, 23, 25, and 33-35 are also believed to be allowable for at least similar reasons as those discussed above.

Withdrawal of the rejection of claims 3, 7, 8, 12, 14, 18, 19, 23, 25, and 33-35 under 35 U.S.C. §103(a) is respectfully requested

### CONCLUSION

In view of the above amendments and remarks, allowance of the pending claims is respectfully requested.

Respectfully submitted,

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By: 

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